SYSTEMS, METHODS, AND APPARATUSES FOR PRODUCING AND PACKAGING FLUIDS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of U.S. Provisional Application Ser. No. 62/939,855, entitled Systems, Methods, and Apparatuses for Producing and Packaging Fluids, filed Nov. 25, 2019, Attorney Docket Number AA104, and claims the benefit of U.S. Provisional Application Ser. No. 62/939,870, entitled Fluid Reservoirs and Related Methods, filed Nov. 25, 2019, Attorney Docket Number AA125, and also claims the benefit of U.S. Provisional Application Ser. No. 62/939,862, entitled Systems, Methods, and Apparatuses for Producing and Packaging Fluids, filed Nov. 25, 2019, Attorney Docket Number AA124.

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0002] This invention was made with Government support under Agreement HHSO100201900017C, awarded by HHS. The Government has certain rights in the invention.

BACKGROUND

Field of Disclosure

[0003] This disclosure relates to medical fluids. More specifically, this disclosure relates to the generation and packaging of medical fluids.

Description of Related Art

[0004] Almost every hospitalized patient is administered saline or a saline based solution. As a result, the quantity of saline solution consumed is very large. More than a billion bags of saline are used per year in the US alone. Despite the demand, there are only a small number of different saline manufactures which provide this solution for the US market. Unfortunately, manufacturing challenges which limit production from one manufacturer can and do cause shortages of saline in the United States. Compounding the issue, these manufactures have uneven market share in regards to all bagged saline products. For instance, 50% of 250 ml or smaller saline bags are provided by a single manufacture. As a result, when such a manufacturer faces production problems, the impact on the availability of that particular type of bag is much greater.

[0005] Most recently, the media spotlight has been shown on delays caused in the wake of hurricane Maria which have led to a shortage of small volume saline bags. According to the American Society of Health-System Pharmacists, shortages for large volume bags and bags of saline for irrigation purposes also currently exist. An alternative means of producing medical fluid bags which may perhaps be locatable in the institution using the bag would be desirable.

SUMMARY

[0006] In accordance with an embodiment of the present disclosure, a sealing member dispenser may comprise a dispenser body including at least one trough configured to receive a plurality of sealing members and an exit port extending from the trough to an exterior face of the dispenser body. The exit port may have a guide portion adjacent the exterior face of the dispenser body. The sealing member dispenser may further comprise a blocking element that obstructs passage of a sealing member through the exit port. The sealing member dispenser may further comprise a cover coupled to the dispenser body and overhanging the trough. The cover may include an orifice in line with the exit port. The orifice may present an opening which is too smaller for a sealing member of the plurality of sealing members to pass therethrough.

[0007] In some embodiments, the trough may extend along a spiral path. In some embodiments, the dispenser body may be a drum. In some embodiments, the guide portion may include a funneling contour. In some embodiments, the guide portion may be a chamfered edge. In some embodiments, the guide portion may be a filleted edge. In some embodiments, the blocking element may be displaceable. In some embodiments, the blocking element may be an outlet cover which is coupled to a handle. Displacement of the handle may result in displacement of the outlet cover out of an obstructing position. In some embodiments, the blocking element may include a detent member which protrudes into the exit port. In some embodiments, the detent member may be a ball detent. In some embodiments, the sealing member dispenser may further comprise a follower and a bias member coupled to the follower and a portion of the dispenser body. In some embodiments, the bias member may be a constant force spring. In some embodiments, the dispenser body may further comprise a receiving slit sized to accept a follower. In some embodiments, sealing member dispenser may further comprise a magnetic body. In some embodiments, the sealing member dispenser may further comprise a rotor which is coupled to a shaft and a bias assembly configured to exert a biasing force against the shaft with urges the shaft to rotate. In some embodiments, the sealing member dispenser may include a rotor which is coupled to a shaft. In some embodiments, the sealing member dispenser may include a rotor drive assembly configured to automatically index the rotor until a sealing member is displaced along the trough to the exit point. In some embodiments, the rotational displacement for indexing the rotor may vary as the sealing member dispenser is depleted of sealing members.

[0008] In accordance with another embodiment of the present disclosure a reservoir feeding apparatus may comprise a housing block including at least one channel extending therethrough. The reservoir feeding apparatus may further comprise a set of retention pins associated with each of the at least one channel. The reservoir feeding apparatus may further comprise a set of guides associated with each of the at least one channel. There may be a slot defined between the guides of each set of guides. The reservoir feeding apparatus may further comprise a feed plate coupled to the housing block by at least one bias member. The feed plate may include at least one follower projection. The reservoir feeding apparatus may further comprise an elongate member extending from the housing block through the feed plate. The bias member may urge displacement of the feed plate along the elongate member toward a stop face of the housing block. The bias member may also be configured to urge the follower projection into contact with a port of a reservoir disposed within the guide.